



Advanced Research Projects Agency • ENERGY

## HEATS PROJECT

# HALOTECHNICS

## MOLTEN GLASS FOR THERMAL STORAGE

PROJECT TITLE:	Advanced Molten Glass for Heat Transfer and Thermal Energy Storage		
ORGANIZATION:	Halotechnics, Inc.	LOCATION:	Emeryville, CA
PROGRAM:	HEATS	ARPA-E AWARD:	\$3,303,719
TECH TOPIC:	Concentrated Solar & Nuclear Power	PROJECT TERM:	1/1/12 – 12/31/14
WEBSITE:	www.halotechnics.com		

### CRITICAL NEED

There is a critical need to find efficient, cost-effective thermal energy storage solutions to maximize the use of domestic solar and nuclear energy resources. Most utility-scale solar power plants only run at about 25% of their capacity because they can't generate power at night—thermal energy storage makes it possible to increase this capacity to up to 60-75%. Similarly, nuclear power plants produce a constant output of power—thermal energy storage could help increase this output during times of critical peak demand.

### PROJECT INNOVATION + ADVANTAGES



Halotechnics is developing a high-temperature thermal energy storage system using a new thermal-storage and heat-transfer material: earth-abundant and low-melting-point molten glass. Heat storage materials are critical to the energy storage process. In solar thermal storage systems, heat can be stored in these materials during the day and released at night—when the sun is not out—to drive a turbine and produce electricity. In nuclear storage systems, heat can be stored in these materials at night and released to produce electricity during daytime peak-demand hours. Halotechnics new thermal storage material targets a price that is potentially cheaper than the molten salt used in most commercial solar thermal storage systems today. It is also extremely stable at temperatures up to 1200°C—hundreds of degrees hotter than the highest temperature molten salt can handle. Being able to function at high temperatures will significantly increase the efficiency of turning heat into electricity. Halotechnics is developing a scalable system to pump, heat, store, and discharge the molten glass. The company is leveraging technology used in the modern glass industry, which has decades of experience handling molten glass.

### IMPACT

If successful, Halotechnics would enable low-cost and efficient thermal energy storage for concentrating solar and nuclear power applications.

- **SECURITY:** Cost-effective thermal energy storage would enable increased use of domestic energy resources like solar and nuclear—strengthening the nation's energy security.
- **ENVIRONMENT:** Cost-effective thermal energy power generation could help decrease fossil-fuel-based electricity use and harmful emissions from coal-burning power plants.
- **ECONOMY:** Thermal energy storage systems could make it less expensive to generate power from nuclear and renewable solar energy, which in turn could help stabilize electricity rates for consumers.
- **JOBS:** Widespread use of advanced energy storage technologies could create jobs in engineering, manufacturing, and construction to support the development of utility-scale solar and next-generation nuclear energy plants.

### CONTACTS

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